Sampling of Bottom Sediments in the Vicinity of the Ongul Strait, East Antarctica

— Report No. 2 of the Geology Section of the 10th Japanese Antarctic Research Expedition —

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東南極オングル海峡付近の底質採集

——第10次南極地域観測隊地質部門報告 (2)——

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要　旨

1969年7月～9月の間，第10次日本南極地域観測隊の地質部門員により，オングル海峡付近の，ラングホブデ氷河—三ツ岩間の20点で，海氷上から底質採集が行なわれた．

採集した標本はコア11本，ドレッジ9袋で総重量は 40 kg である．この地域の底質は大部分粘土質の泥でケイ藻や貝殻片をひんぱんに含んでいる．数10m以浅では岩石質の場合が多い。

低温のために採集作業は困難なものであったが，機械，装備に改良の余地があり，今後のくふうによってやりやすいものになる．

1. Introduction

This is a report on part of the activities of the geology section of the 10th Japanese Antarctic Research Expedition. An outline of the sampling of bottom sediments in the vicinity of the Ongul Strait during the winter season of 1969 is given.

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sampling to whom the authors' gratitude is expressed here.

2. Outline of the Survey

The sampling of bottom sediments in the vicinity of the Ongul Strait between the snout of the Langhovde Glacier and Mitsu-iwa Rock (temporary name, see Fig. 1) was carried out for about 10 days in July, August, and September in 1969 (Fig. 1 and Table 1). The collected samples were 11 core samples and 9 dredge samples. The total weight of the samples was 40 kg.

From the field observations, the bottom sediments of the present district are

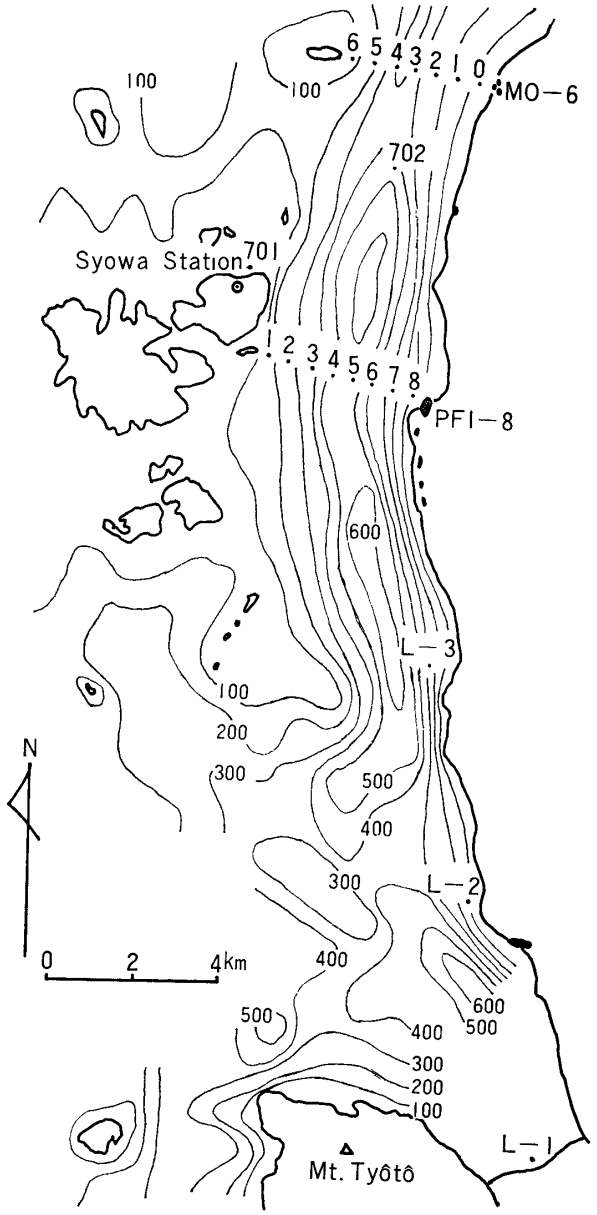

Fig. 1. Sampling locations. The bottom topography is obtained from the unpublished data of K. FUJIWARA.

Table 1. Samples of bottom sediments collected in the vicinity of the Ongul Strait.

Site	Depth (m)	Sampler used C	Sampler used D	Constituents	Remarks	Sample No.
M0	57	×	×			69071201
M1	350#	○	—	Silt with less amount of small rounded pebbles	Thrust several times	69092801
M2	500#	△	—	Silt with few amount of small rounded pebbles	〃	69092802
M3	575#	×	—	Small rounded pebbles		69092803
M4	375##	×	△	Sandy silt with small breccia and shell flakes		69093001
M5	100##	×	—	Sandy silt with shell flakes	Adhered around the core sampler	69093002
M6	50##	×	—	〃	〃	69093003
PF1	98	×	×			69071701
PF2	299	×	△			69071702
PF2		×	—	Silt	Adhered around the core sampler	69091002
PF3	347	×	—	Sandy silt	〃	69071901
PF4	480#	×	△			69071902
PF5	570#	○	—	Clay-silt	Thrust twice	69091001
PF6	536	○	—	〃	〃	69091701
PF7	236	○	—	Sandy silt with sand	〃	69091702
PF8	99	◎	—	Sandy silt with pebbles		69091703a
PF8		△	—	Pebbles with good amount of diatom-like material	Thrust several times	69091703b
L1	514	◎	—	Clay-silt with soft mud on the surface		69092001
L2	258	◎	—	〃		69092002
L3	319	◎	—	〃		69092003
701	36	×	×	Pebbles		69070101
702	598	◎	—	Clay-silt		69070102

◎ Good core sample collected by one thrusting.

○ Collected in a fair amount.

△ Collected in a small amount.

× Collected in a very small amount.

— Not operated.

Deduced from the depth-sounding chart prepared by Kenzo FUJIWARA in 1968 (not published).

Deduced from the speed of the winch.

C: Core sampler. D: Dredge sampler.

characterized by the wide distribution of dark bluish-gray homogeneous claii silt. Gravels or basal rocks are distributed at the sites shallower than some tens of metres. Diatoms and fragments of shells were often observed in the samples.

The samples were frozen and brought back to Japan. Detailed investigations on the samples are to be carried out by Professor N. NASU and others.

3. Operation and Instruments

The sampling was made through the see ice. A wooden sledge was equipped with hydrographic winch, generator, stage for the samplers, and others (Fig. 2).

It was not easy to overcome difficulties in the operation due to the severe cold and the sea water.

Some of the instruments used are described below.

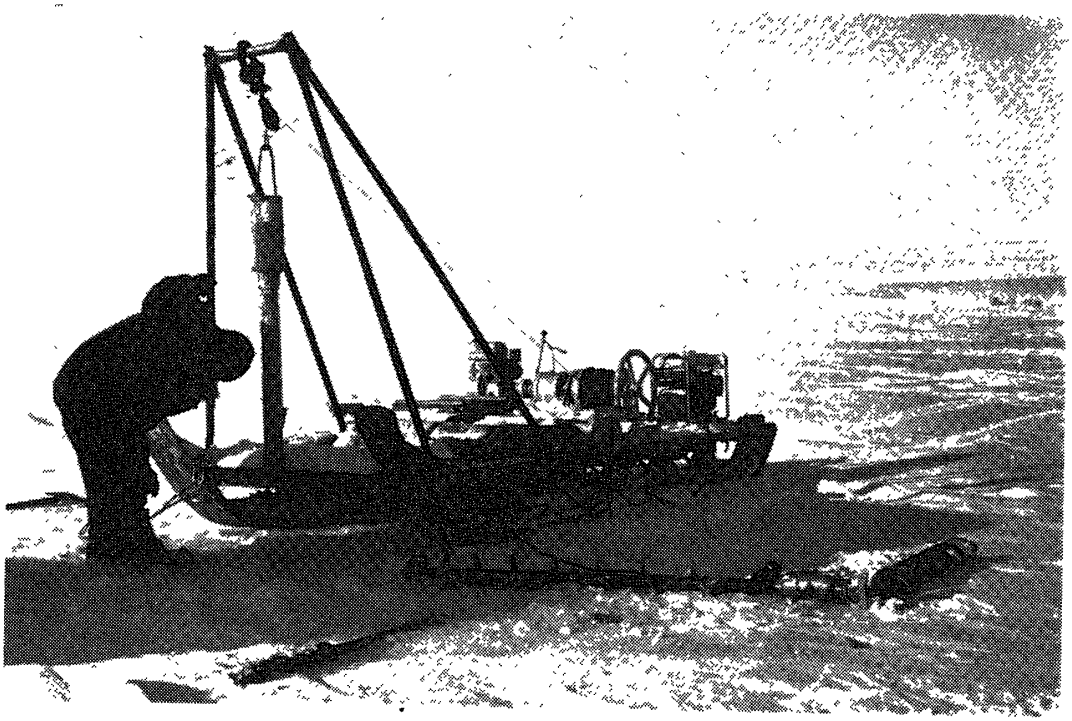

Fig. 2. A special sledge for bottom sediment sampling.

Table 2. Type of samplers.

Sampler	Diameter		Length of the container (mm)	Total length (mm)	Total weight (kg)
	inner (mm)	outer (mm)			
Core sampler	75	150	885	1600	85
Dredge sampler	130	150	770	800	45

Samplers: A core sampler, 82 kg in weight and 75 mm in the inner diameter, and a dredge sampler 45 kg in weight were used (Table 2). Both were specially designed for the present purpose. In some cases, two or three successive thrusts of the core sampler were required to get sediments, releasing the sampler at 10 m above the bottom. The average length of the core taken by the first thrust was 40–60 cm. The dredge sampler was almost useless for the present purpose because of its inadequate design.

Drilling of see ice: An electric-motor driven earth auger with a power of 1 KVA was diverted for the drilling with bits of 85, 150, and 200 mm in diameter. A hole with a diameter of about 240 mm was opened by using these bits successively from smaller to larger ones.

Winch and cable: A winch, which is, used for ordinary construction work with a 5 HP gasoline engine, was used. A steel cable of 1,000 m long and 3 mm in diameter was used.

Measurement of depth: An ordinary meter-gage was used. The gage, however, often failed to work, so that alternative methods were used to determine depths (see footnote of Table 1).

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